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Synapse

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MIT's McGovern Institute Honors Dr. Michael Davis

The McGovern Institute has announced that CBN Member Michael Davis, Ph.D., a Robert W. Woodruff Professor of Psychiatry and Behavioral Sciences at Emory University School of Medicine, will be the 2008 recipient of the Edward M. Scolnick Prize in Neuroscience for his work on the neural basis of fear.

The Scolnick Prize is awarded annually by the McGovern Institute to recognize an individual who has made outstanding advances in the field of neuroscience.

"This is an enormous honor, and I am extremely grateful to the McGovern Institute and their review committee for this prestigious award and very generous prize," says Dr. Davis.

Over the last three decades, Dr. Davis, who is also a researcher at the Yerkes National Primate Research Center, has devoted his career to providing fundamental insights into the way humans learn fearful associations. He has contributed to important studies showing that fear learning is controlled by a class of molecules known as NMDA receptors, acting within a brain structure called the amygdala.

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News? Story Ideas?
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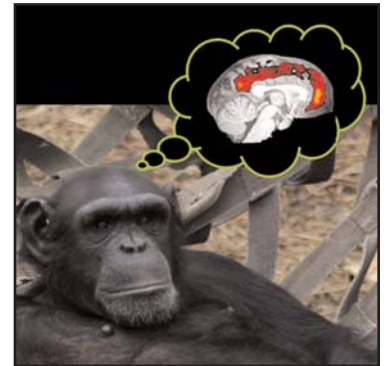
Editor: Martha Barker Koontz

Brain Imaging Shows Similarities & Differences in Thoughts of Humans and Chimps

In the first study of its kind, researchers at the Yerkes National Primate Research Center, Emory University, used functional brain imaging to assess resting-state brain activity in chimpanzees as a potential window into their mental world and to compare chimpanzee brain activity to that of humans. The researchers' findings suggest chimpanzees may engage in thought processes similar to those of humans at rest, as well as thought processes that are quite different. The findings are significant because they show the uniqueness of humans, as well as our similarity to our closest living primate relative.

According to CBN member and lead researcher Jim Rilling, Ph.D., "Examples of resting-state thoughts are when your mind wanders to past social interactions, to potential future social interactions and to problems you need to solve."

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Jim Rilling, Ph.D., research findings showed significant overlap in brain activity patterns of humans and chimpanzees. Photo courtesy of Jim Rilling, Ph.D., and Lisa Parr, Ph.D.

CBN Encourages Georgians to Celebrate the Brain



Visitors to the Brain Expo on Saturday, April 5, at Zoo Atlanta will get the opportunity to participate in brain games such as trying to walk the line while wearing distortion goggles.

Gorgia Governor Sonny Perdue has proclaimed March Brain Awareness Month (BAM) in Georgia, and members of the Center for Behavioral Neuroscience and the Atlanta Chapter of the Society for Neuroscience are encouraging teachers, students and families in Georgia to join them in celebrating the brain.

"The brain is small enough to hold in our hands, yet controls every aspect of our thoughts, perception and behavior. Even a small malfunction in the brain can have a huge impact on the lives of individuals and those around them," said Kim Maguschak, a CBN Graduate Scholar, member of the Atlanta Chapter of the Society for Neuroscience and a graduate student in the Emory University Neuroscience Program.

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NSF Site Visit Team Applauds CBN Members

During the National Science Foundation's November site visit to evaluate our accomplishments, a team of noted scientists representing the NSF applauded the "high quality of research conducted by members of the CBN."

"The CBN has significantly enhanced the prominence of the Atlanta neuroscience research base. The combination of training, research productivity, outreach activities and knowledge transfer is a winning formula for science and economic development," the team wrote in its annual site visit report.

The report also stated, "scientific progress demands that techniques and levels of analyses be well integrated across disciplines. However, intra- and inter-institutional barriers often

and PTSD. And, to our community partners who work with us to educate our state about the importance of the brain and behavior.

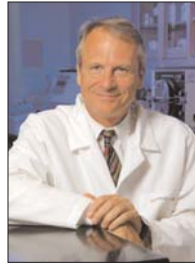
Just last week, in support of the hard work of Georgia's neuroscience researchers and educators, Governor Sonny Perdue signed a proclamation naming March "Brain Awareness Month" in Georgia.

During the month, we are teaming with the Atlanta Chapter of the Society of Neuroscience to bring neuroscience to metro Atlanta classrooms. Last year, our volunteer students and faculty members reached out to more than 7,600 K-12 students. We are also

looking forward bringing neuroscience to the Atlanta community on Saturday, April 5, during our annual Brain Expo at Zoo Atlanta. Last year's Expo brought in more than 4,000 visitors, and we are planning for an even larger crowd this year.

With these accomplishments under our belts, and with the CBN located in the heart of the state's rapidly expanding life

sciences industry, we are planning to continue conducting groundbreaking research and educating Georgia's residents about the brain and behavior in the years to come. ■



H. Elliott Albers, Ph.D.
CBN Director



Members of the CBN and Atlanta Chapter of the Society for Neuroscience met with Governor Sonny Perdue as he signed a proclamation declaring March "Brain Awareness Month" in Georgia. Pictured from left: Pete Wenner, Ph.D., Kim Maguschak and Kerry Ressler, Ph.D., of Emory University; Elliott Albers, Ph.D. of Georgia State University; Georgia Governor Sonny Perdue; and Michael Black, Ph.D., Anne Murphy, Ph.D., and Paul Katz, Ph.D., of Georgia State University. Photo courtesy of Gov. Sonny Perdue's Office

prevent the integration of scientific ideas, methodologies and cultural attitudes. The CBN is now a leader, both nationally and internationally in meeting these challenges."

We owe this recognition to our members, whose innovative research has led to important insights into possible treatments for autism, obesity,

New Venture Grants

Effects of orbital frontal cortex, hippocampal, or amygdala lesions on safety signal learning in non-human primates: Using a novel conditioned inhibition procedure, this project will evaluate safety signal learning in rhesus monkeys that have sham lesions or lesions of either the hippocampus, orbital frontal cortex, and lesions of the amygdala.

Role of central oxytocin in maternal and affiliative behavior in rhesus monkeys: effect of a non-peptide oxytocin antagonist: This project will test the hypothesis that an oxytocin antagonist (L368,899), recently shown to cross the blood brain barrier (BBB) after peripheral injection, will lead to a dose-dependent decrease in maternal and affiliative behaviors in female rhesus monkeys.

CREB signaling in pheromone-dependent olfactory recognition memory: The goal of this project is to investigate CREB involvement in AOB dynamics by using immunohistochemistry, blotting and in vivo antisense technology.

Neural mechanisms of emotion perception and their relationship to empathy in autism spectrum disorders and typical development: This project will examine the neural mechanisms underlying emotion perception, and the relationship between empathy and this network using fMRI and diffusion tensor imaging during an emotion perception task with individuals with autism spectrum disorders and typical individuals to investigate emotion perception in specific regions of interest (ROIs), such as amygdala, superior temporal sulcus, and anterior cingulate, and in the connections between these ROIs.

NEXT VENTURE GRANT DEADLINE
May 16, 2008

All applications must be submitted via email to Kelly Powell (kpowell@gsu.edu) as a Word or PDF document, no later than 5:00 p.m.

CBN Student Receives Prized Suttles Fellowship



Joe Normandin, a CBN Graduate Scholar and Georgia State University doctoral candidate working in Anne Murphy's lab, recently received a Suttles Fellowship.

The Suttles Fellowship is generally awarded to the most outstanding doctoral student who has applied to the University Research Dissertation Grant Program. It is intended to help full time doctoral students meet the cost associated with their dissertation efforts.

In addition to his studies, Joe is a member of the CBN Graduate Student Association Steering Committee, and co-chair of the Neurobiology and Behavioral Graduate Student Association.

Brain Imaging

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Working with his research team that included Yerkes, Emory College and/or the Center for Behavioral Neuroscience colleagues Sarah Barks, Todd Preuss, Ph.D., and Lisa Parr, Ph.D., and using positron emission tomography (PET), Rilling studied eight humans and five chimpanzees. Results showed significant overlap between human and chimpanzee brain activity patterns such as high levels of activity in the medial prefrontal and medial parietal cortex, brain regions associated with reflecting on mental states of self and others. Results also showed differences with humans, including activity in regions associated with language and the analysis of meaning; these were found in humans but not chimpanzees.

“Widespread activity in language

regions of the human brain suggest humans think with words, though, of course, chimpanzees do not,” said Dr. Rilling.

In choosing to image resting-state brain activity, the researchers reasoned if the pattern of brain activity in chimpanzees at rest is similar to humans, there is likely to be some similarity in cognition; conversely, they thought, if there are differences in brain activity during rest, it would imply differences in resting-state cognition.

Researchers plan to further study chimpanzee brain activity by imaging the animals while they are engaged in tasks that specifically drive mental processes the researchers hypothesize to be ongoing at rest. ■

Story courtesy of: Emily Rios, Yerkes National Primate Research Center, Emory University.

MIT Honor

Continued from page 1

“Fear conditioning is normal and very adaptive, and there’s a mechanism that has evolved to make people remember potentially dangerous things,” Dr. Davis explains. “But for some people, anxiety disorders become crushing weights that keep them from living normal lives.”

While scientists have discovered many of the mechanisms in the brain that are responsible for fear, what they have not discovered is the mechanism that allows humans and other animals to overcome fear and lead normal lives.

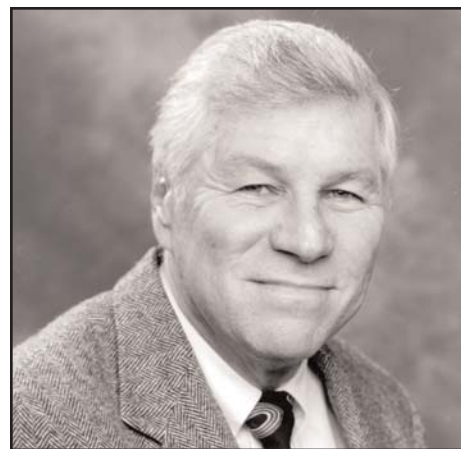
“By determining what areas of the brain are responsible for fear and anxiety, we hope to target those areas and find new therapies for people whose fear overwhelms their ability to function normally.”

To do this Dr. Davis studied the process of extinction - a process by which learned associations such as fearful memories eventually disappear - and showed it uses the same NMDA receptors that cause the brain to acquire fearful associations. Based on this, Dr. Davis's lab showed that a medication

called D-cycloserine (DCS) speeded up extinction of fear. This was predicted based on work by other scientists who had shown that DCS, originally used at high doses to treat tuberculosis, made the NMDA receptor work better when given at low doses.

In 2004, Dr. Davis and his colleagues at Emory, Kerry Ressler, M.D., and Barbara Rothbaum, Ph.D., published the first trial in humans using DCS to speed up fear extinction. Patients with fear of heights took the drug before each therapy session, using virtual reality exposure therapy with a simulated glass elevator. These patients recovered much more quickly than the patients given placebo, and maintained this advantage at three months with no intervening therapy needed. Seed money for this clinical trial was provided by the Center for Behavioral Neuroscience.

Currently, a National Institutes of Mental Health clinical trial is being conducted at Emory using a combination of DCS with virtual reality therapy for Iraq Veterans with post-traumatic



Mike Davis, Ph.D.

stress disorder (PTSD). It is hoped that the addition of the drug will speed recovery for soldiers who have been haunted by combat-related memories.

The McGovern Institute will award the Scolnick Prize to Dr. Davis on Monday, April 14, 2008.

Story and photo courtesy of: Kathi Baker of Emory University

Celebrating the Brain

Continued from page 1

“It is important to inform people about the brain and let them know what is being done to diagnose, treat and prevent brain disorders.”

Activities and events in celebration of BAM include:

K-12 CLASSROOM VISITS

The CBN and the Society for Neuroscience are continuing their tradition of K-12 classroom visits. During the visits, scientists encourage students to participate in fun neuroscience related activities such as build-



Middle school students inspect models, not just human brains, but also the brains of animals such as alligators, rabbits, frogs, and more.

Photo courtesy of Michael Black, Ph.D.

ing a brain out of Play-Doh and touching a real brain.

“Neuroscience is generally not covered in the curriculum of Atlanta schools, therefore we recognize the need to help supplement science education and inspire children to think about careers in neuroscience,” said Michael Black, Ph.D., a CBN Postdoc Fellow of Georgia State University, who works with Kim Maguschak to coordinate Atlanta’s classroom visits.

“Brain awareness is so important because it involves all of us in our daily lives, whether it is the effects of sleep deprivation, jet lag or even how we respond to advertisements,” he said. “It is imperative that future generations have an understanding of how the brain works so they can make informed decisions.”

Last year, the group visited more than 65 different schools and 7,600

students in four counties including Cobb, Gwinnett, Dekalb and Fulton. Teachers who are interested in scheduling a classroom visit, can fill out an online request form at www.atlantabrain.org. All requests are filled on a first-come, first-served basis.

BRAIN EXPO AT ZOO ATLANTA

The CBN’s Brain Expo will take place on Saturday, April 5, from 9:30 a.m. until 4:30 p.m. at Zoo Atlanta. The Expo is a fun, interactive, K-12 and community education program for children and adults that features more than 30 hands-on education stations exploring various topics related to the brain and behavior. Each year, thousands of Expo take part in activities such as building brain art, playing mind-boggling games, and taking their turn at the famous prize wheel.

“The Expo has become the largest educational event of its kind in the country,” said Kyle Frantz, Ph.D., Expo Director, CBN Science Educator and an Assistant Professor of Biology at Georgia State University. “Members of the public seem enthusiastic about gaining knowledge in new areas, as well as, piecing together tidbits they hear on the news with scientific evidence they explore at the Expo.”

In addition to Expo favorites such as touch-a-brain and the giant neuron, this year’s visitors will enjoy visiting new stations. *The Amazing Story of Phineas Gage* will be featured this year. Gage was a railroad worker who suffered severe brain damage in an accident. Changes in his behavior after the damage provided insight into the role of the frontal cortex in emotion, decision-making, and other complex behaviors.

Kids who like to visit the brain art station will enjoy creating “brain bling” to wear home.



Photo courtesy of Michael Black, Ph.D.

Classroom Volunteers Needed

The CBN and the Atlanta Chapter of the Society for Neuroscience members Kim Maguschak of Emory University and Michael Black, Ph.D., of Georgia State University, are coordinating efforts to promote brain awareness throughout metro Atlanta and the state during “Brain Awareness Month.” In order to accommodate the large number of requests from area educators, many great volunteers are needed to help with the month’s outreach activities. It is not necessary for volunteers to design their own activities. Resources are available online. To find out more information and to sign up as a volunteer, log on to: www.atlantabrain.org.



Expo Volunteers Needed

Gain valuable experience teaching science to kids and members of the public as an Expo volunteer. Volunteers are needed for an invitation-only Expo event on Friday, April 4, and for the public Expo on Saturday, April 5. For more information or to sign up as a volunteer, contact Kyle Frantz, Ph.D., via email at kfrantz@gsu.edu.

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ION Program Seeks Assistant Director

The Institute On Neuroscience (ION), an eight-week summer research experience for high school students, invites applications for the position of Assistant Director in 2008. Responsibilities include reviewing applications and interviewing candidates (4-5/08), planning curriculum (based on an established model, 5-6/08), leading instructional activities full-time during the introductory segment of the program (6/9-6/27/08), guiding weekly workshops or activities in the remainder of the program (7/4, 7/11, 7/18, 7/25, and 8/1/08), and evaluating program outcomes (8/08). Successful applicants will be individuals who are interested in active approaches to teaching and learning, and also have experience with laboratory research and scientific writing. Applicants with a Ph.D. in neuroscience or a related field are preferred, and at least a Master's Degree (or equivalent graduate work) is required. Salary based on experience. Please submit curriculum vitae, a brief statement of interest in neuroscience education, and contact information for two references to Program Director, Dr. Kyle Frantz, via e-mail (kfrantz@gsu.edu) with "ION Search" in the subject line. Application review will begin in March and continue until the position is filled.

Brain Camp for Kids Seeks Camp Counselor

Would you like to share your love of neuroscience with our future scientists while earning summer funding and gaining valuable teaching experience? The CBN sponsored Brain Camp for Kids is looking for a postdoctoral or graduate student to hire as a camp counselor. The camp will take place July 28-Aug. 1, 2008, at Renfroe Middle School (City of Decatur) and is for rising fifth- thru rising eighth-grade students. If you have any questions or would like more information, please contact Laura Carruth, Assistant Professor of Biology at Georgia State University and a CBN Educator, at lcarruth@gsu.edu. The camp is a fun and rewarding experience.

Publications

Continued from page 5

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CBN Congratulates Georgia Regional Brain Bee Champ



Congratulations to our winners! From left: Murat Johnson of Parkview High School, first place; Jui Bhingarde of Milton High School, second place; and Yifeli Liu of Chattahoochee High School, third place.

Murat Johnson, a senior at Parkview High School in Gwinnett County, bested more than 23 of his peers on Feb. 2, 2008 to claim the 2008 Georgia Regional Brain Bee Competition, which took place at the Fernbank Museum of Natural History.

Johnson will represent Georgia in the National Brain Bee Competition, March 14-15, 2008 in Baltimore, MD.

This year's judges included: Kelli Duncan of Georgia State University, and Alyson Zeamer and Christa Payne of Emory University.

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